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Bulletin No. 31
February '58

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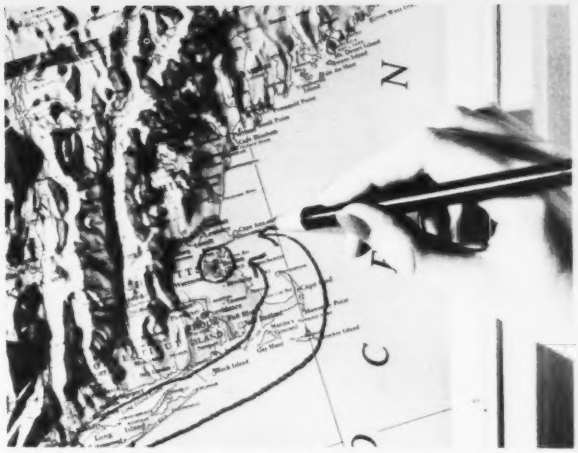

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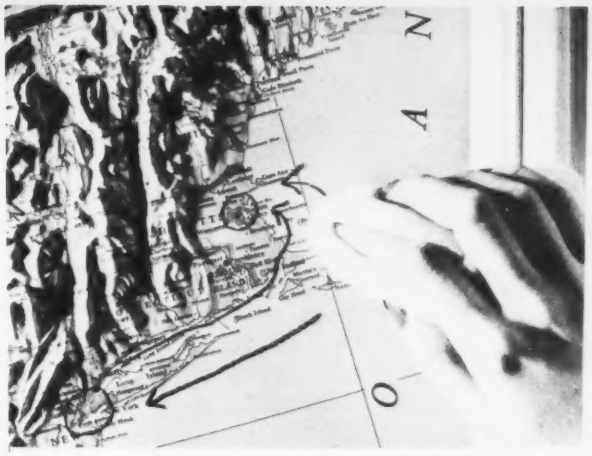

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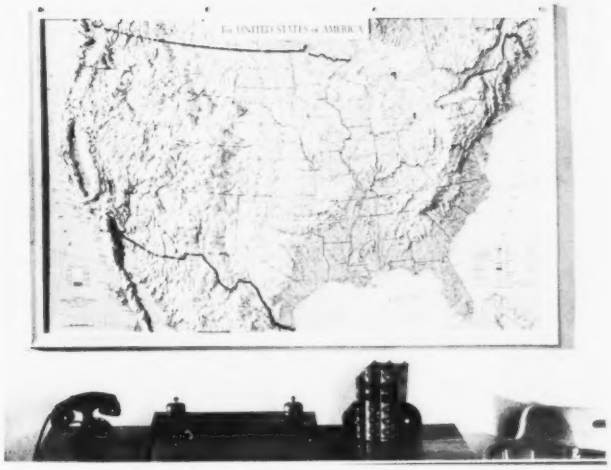

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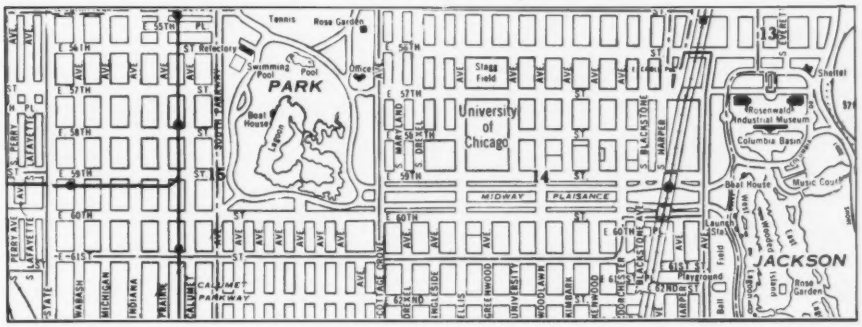

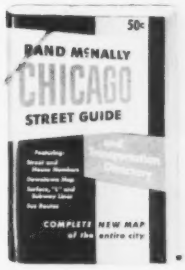

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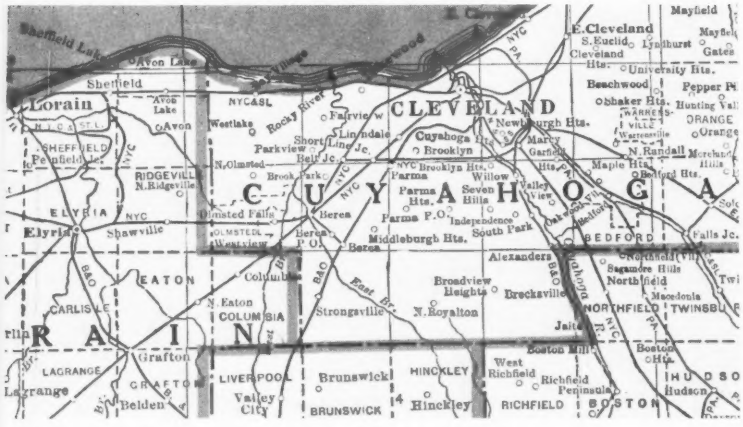

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EDITOR'S PAGE

Response to the questionnaire issued with the Bulletin over a year ago indicated that some members of the Division would like to see the Bulletin do more with the historical approach to cartography and geography. By happy coincidence the Editor also has leanings in this direction. Both this issue and the one to follow in April will contain material on the theme of Historical Geography and Cartography.

In this February issue our lead article is by John K. Wright, former Director of the American Geographical Society. He brings to us a long-time interest in the history of geography. Our second article, about a long-unsung group of materials, is by Edward P. Thatcher, Science Librarian of the University of Oregon Library. Continuing our historical theme we have reviews of F.L. Coffmans two works on buried treasure and the Rand McNally Atlas of World History.

George R. Dalphin

SPECIAL LIBRARIES ASSOCIATION 49th ANNUAL CONVENTION
HOTEL SHERMAN, CHICAGO, ILLINOIS
June 8 - 12, 1958

A program of Division activities will be printed in the April 1958 issue of the Bulletin.

A special, scheduled field-trip to Urbana and the University of Illinois seems improbable but Bill Woods wishes it known that he will be happy to entertain individuals in Urbana on Friday, June 13.

BACK ISSUES OF BULLETIN

Geography and Map Division members who have any back issues of the Bulletin which they do not wish to keep are urged to donate them to the Division. They are needed to fill orders for complete runs of the Bulletin or for separate issues. Numbers 1 through 16, 20, 22, and 26 are out-of-print. Numbers 23 and 27 are in low supply. Send them to Bill M. Woods, University of Illinois Library, Urbana, who handles the distribution.

NEW PUBLICATION

Bibliotheca Cartographica, a new international bibliography of cartographical literature is published in Remagen, Germany under the editorship of K.H. Meine, H. Kramm, and R.D. Schmidt. Heft 1/2, 1957 of this semiannual compilation contains 67 pages and includes 950 cartographical entries under twelve major headings. United States reference are compiled by Walter W. Ristow, Library of Congress. Published by the Bundesanstalt für Landeskunde (Bergstr. 38, Remagen) in collaboration with the German Gesellschaft für Kartographie, each issue is priced at DM 3.50. (Nordis Felland)

THE HEIGHTS OF MOUNTAINS

"AN HISTORICAL NOTICE"

by
John K. Wright

> "As the perpendicular elevation of mountain summits above the level of the sea...is still, like all that is difficult of attainment, an object of popular curiosity, the following historical notice of the gradual progress of hypsometric knowledge may here find a suitable place."[1] --Von Humboldt.

The elevation of mountains continues to be "an object of popular curiosity." This springs partly from the human love of superlatives and "records." It is pleasurable to know the elevation of the highest point in one's town or state or country and compare it with that of Mt. Everest. Views like the one reproduced on the opposite page can fascinate both old and young. Mountain climbers, in particular, find solace (or pain) in comparing the heights to which they have attained with those to which others claim to have attained. In 1907 Mrs. Workman was exercised by Miss Peck's claim to have reached 24,000 feet on Huascarán (22,205)[2] in Peru, a record that would have surpassed her own of 23,263 feet in the Himalayas. Accordingly she dispatched an expedition of three French topographical engineers to triangulate Huascarán. To her gratification they reported it to be only 22,187 feet high.[3] On June 23, 1802, Humboldt made his famous ascent on the slopes of Chimborazo (20,577) in Ecuador, to an altitude that he estimated at 19,286 feet. Twenty-six years later he wrote his friend, Heinrich Berghaus: "All my life I prided myself on the fact that of all mortals I had reached the highest point on earth, I mean on the slopes of Chimborazo. It was therefore with a certain feeling of envy that I learned of the accomplishments of Webb and his companions in the mountains of India..."[4] But Webb's accomplishments did not deprive Humboldt of his supposed climbers' altitude record. They merely showed that Chimborazo is not the world's

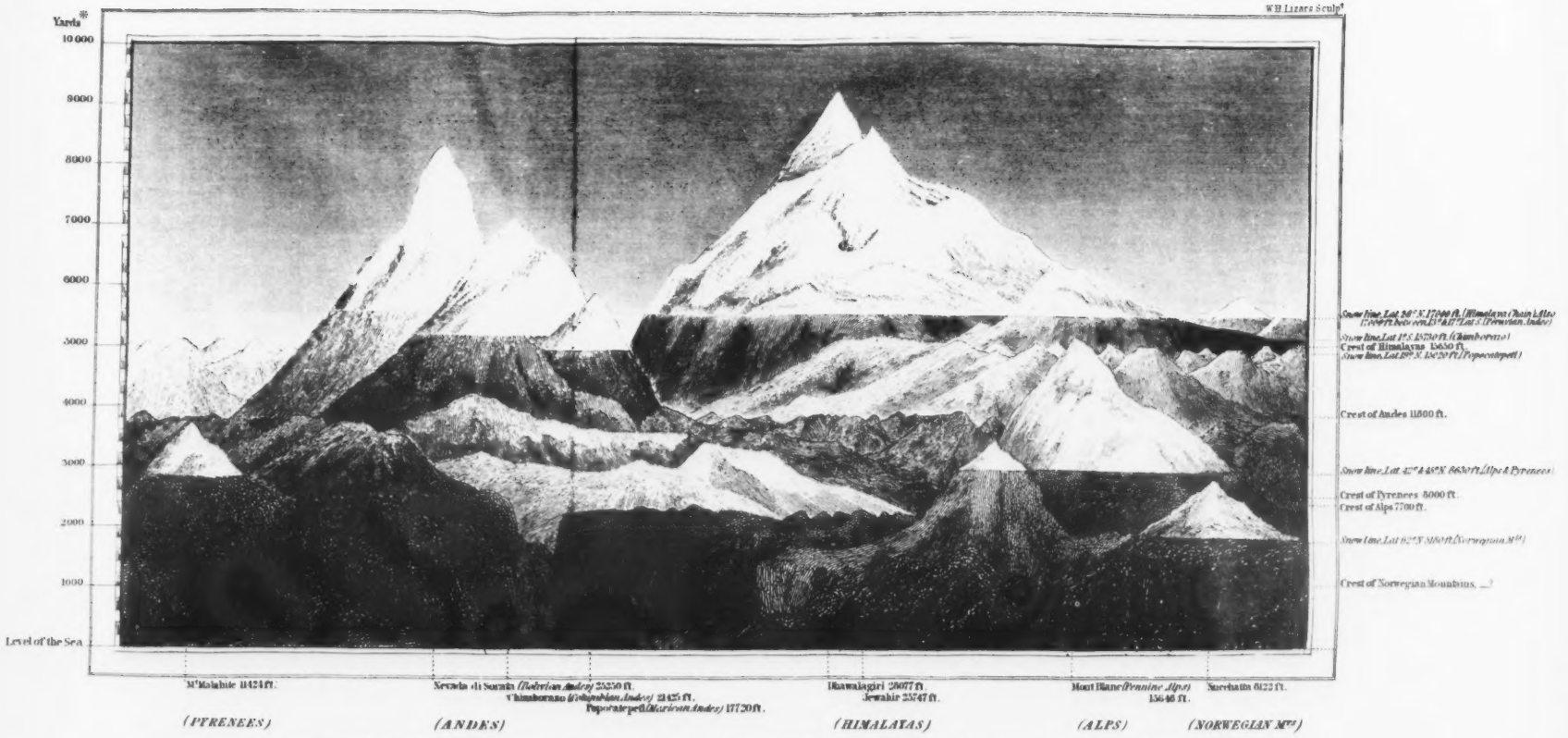
---

Illustration Note

The adjacent plate of mountain heights is a reproduction of Plate 70, "Tabular View of the Principal Mountain Chains in the World," from (W.H.) Lizar's Edinburgh Geographical General Atlas <1842>?

Some earlier atlases which contain similar plates of world-wide mountain heights are listed below:

James Wyld - Cabinet Atlas, Edinburgh, 1819
Laboisne - A Complete... American Atlas, Philadelphia, 1822
Fielding Lucas - A General Atlas, Baltimore, 1823
Anthony Finley - New General Atlas, Philadelphia, 1824
Buchon - Atlas... Deux Amériques, Paris, 1825
T.G. Bradford - A Comprehensive Atlas, Boston, 1835



CULMINATING POINTS & MEAN HEIGHT OF THE PRINCIPAL CHAINS OF MOUNTAINS OF EUROPE AMERICA & ASIA:
WITH THE LOWER LIMIT OF PERPETUAL SNOW IN DIFFERENT LATITUDES.

highest peak. In 1880, however, Edward Whymper, who made the first ascent to the summit of Chimborazo, was led to harbor doubts that Humboldt could have gone even as high as certain ledges that he, Whymper, photographed at 18,528 feet,[5] and A.H. Bent in 1913 pointed out if Humboldt had not exceeded that elevation, his boast of having climbed higher than any other mortal was invalid:[6] in 1677 a party from Arequipa had reached the summit of El Misti (19,166) (and, what is more, they had been fairly energetic while there, having "exorcised the crater, cast in holy relics, celebrated Mass, and set up a great cross on the highest place"[7]).

Though it had a competitive, sporting component, Humboldt's interest in mountain heights was prompted mainly by scientific motives.[8] It was a by-product of his researches concerning variations in the general elevation of land masses and of the snow line and life zones---studies that went far toward putting the geography of plants and animals on a three-dimensional basis. Indeed, the principal incentives for the costly surveys to measure the heights of mountains that have been in progress since the early eighteenth century have been scientific, the leading motive being, perhaps, the advancement of geodesy and through it of mapping. The altitude markers embedded in the rock of many a mountain summit were put there to aid surveyors, not to amuse tourists and climbers. "Accurate triangulation over large areas made it necessary to erect signals on hills and mountain tops which could be seen many miles. The accurate computation of a meridian line made it necessary to reduce distances to sea level. This could not be done unless the heights of mountain stations above sea level were known."[9]

Despite such popular and scientific interest, the history and the bibliography of mountain measurements have been neglected; and hence this "historical notice," in which three matters will be touched upon lightly (but, perhaps, with sufficient bibliographical information in the notes to start an inquirer on his way): 1) the development of methods of measuring mountain heights; 2) the question of the world's highest known mountain; and 3) certain early mountain measurements and estimates in the Americas.

THE DEVELOPMENT OF METHODS

Peschel in his now old but continuingly useful Geschichte der Erdkunde[10] traced the development of the theory and practice of mountain measuring down to about 1850. More recently the late Professor Florian Cajori (1929)[9] and Professor Knut Lundmark[11] (1942) have dealt comprehensively in periodical articles with the history of methods of mountain hypsometry. Cajori distinguishes three chief ways in which the ancient Greeks sought to determine altitutdes: measurement of angles, observation of the distances from which mountains may be seen at sea, and precise levelling. Of these, the last was by far the most accurate, but, though used effectively in engineering operations (e.g. in the construction of canals, aqùeducts, etc.), it does not seem to have been applied to mountains until modern times. Of about a dozen specific mountain altitudes on record as having been determined by ancient Greeks, even the most accurate, that for Mr. Cyllene, may have been an overestimate of as much as 17 percent of the actual height (7792).[12] Probably the first occasion upon which the height of a mountain was measured with any close approach to accuracy was during the Cassini survey of an arc of meridian in

France in 1700-01, when the altitude of Mt. Canigeu, in the eastern Pyrenees overlooking the Mediterranean, was determined by triangulation with an overestimate of less than one percent of the present figure (9137).[13]

What might be called "atmospheric" methods of hypsometry---methods involving measurements either of barometric pressure or of the temperature at which water boils---were not developed until modern times. Although experiments were begun in the measuring of heights by means of the barometer soon after Toricelli's discovery of the principle of that instrument in the 1640's, and although J.J. Scheuchzer measured the altitudes of certain Alpine passes and peaks barometrically in 1706-07, barometers were not sufficiently perfected for general hypsometric use until the 1770's.[14] Indeed the heights of few mountains were actually determined by any instrumental procedures before the nineteenth century. Thus in 1807 Humboldt could list only 122 measured mountains throughout the world: 30 in the Americas, of which he himself had measured 24; 28 in Europe (including Iceland and Spitzbergen); 2 in Africa, and 2 in Asia.[15] By 1829, however, some 4000 measured heights were listed in a German encyclopedia.[16]

THE WORLD'S HIGHEST KNOWN MOUNTAIN

In former times men were prone to conjure up visions of mountains of enormous height in unexplored parts of the world. Such was the mountain that Cosmas Indicopleustes located in the far north to explain the succession of night and day; such was Dante's Mount of Purgatory, the supposed precise altitude of which has been learnedly discussed,[17] and also "Mt. Hercules, 32,783 ft. above the sea," which appears on a map in, and is pictured in frontispiece of, a book of faked explorations in the interior of New Guinea published in 1875.[18]

By contrast, the actual measurements of mountain heights undertaken in ancient Greek times gave rise to a long-lasting belief among the more scientifically minded that the world's loftiest mountains are only about the height of Mt. Washington, N.H. (6288), or perhaps half again as high. With the aid of a dioptra, a primitive form of theodolite, first the distance of a mountain from the observer and then its altitude could be determined by simply comparing similar triangles. This is believed to have been the method employed by Dicaearchus (c 350-290 B.C.) in estimating the altitude of Mt. Pelion (5252) in Thessaly at 1250 paces (6062 feet), of Mt. Cyllene (7792) in the northern Peloponnesus at "less than 15 stadia" (9101 feet), and of Mt. Atabyrius (3986) in Rhodes at "less than 10 stadia" (6068 feet), and probably also by a certain Xenagoras whom Plutarch records as having measured the height of Mt. Olympus (9570) at "10 stadia and a plethrum less four feet" (c6163 feet).[19]

It will be seen that Dicaearchus' figures are overestimates, the most accurate being the one for Cyllene, whereas Xenagoras' figure for Olympus does scant justice to the abode of the Gods. Dicaearchus and Eratosthenes (c276-c194 B.C.) are both said to have maintained that the highest mountains do not exceed 10 stadia (6068 feet) in height, although this does not accord with the foregoing figures for Pelion and Cyllene. Cleomedes (second century after Christ) wrote as follows: "Those who say that the earth cannot be spherical because of the depressions occuring in the ocean and the elevations

of the mountains, speak without reason. The height of mountains does not exceed 15 stadia (9101 feet) and the depth of the ocean is not more. But 30 stadia have a vanishingly small ratio to 80,000 stadia (the earth's diameter). It is like dust upon a ball."[20]

Aristotle, in a frequently quoted passage in his Meteorology, give as evidence of the supposed immense height of the Caucasus the fact that it can be seen from certain points at great distances from its base and also the purported observation that "the sun shines on its peaks for a third part of the night before sunrise and also after sunset."[21] From the latter observation later students, unlike Aristotle, drew inferences as to the specific height of the Caucasus. Thus, one Scipione Chiaramonti (1565-1652) calculated that the altitude might be anywhere between 115 and 1539 miles, extremes dependent upon whether the height be reckoned with reference to a nocturnal illumination occurring when the sun is at the summer solstice or at the winter solstice, respectively.[22] A contemporary of Chiaramonti, Father J.B. Riccioli, S.J. (1598-1671), author of a learned treatise on mathematical geography and its history,[23] felt that Chiaramonti's figures were "absurd," but that if refraction be considered Aristotle's statement would imply that the Caucasus is not less than 47,000 nor more than 57,000 paces high (43-52 miles). Riccioli believed it not impossible that the world's highest mountain---some peak unknown to him---might reach to an altitude of 64,000 paces (59 miles).[25]

Peschel shows that between the early sixteenth and early eighteenth centuries the world's highest mountains were located by different authorities in the Urals, in Novaya Zemlya, in the Canaries (Peak of Teide in Teneriffe), and in the Alps (the mountains near the St. Gotthard Pass, the Titlis, and finally Mt. Blanc).[26] Meanwhile, Acosta's experiences with mountain sickness (soroche) in the Andes had induced him to believe the South American mountains were even higher. In his Natural and Moral History of the Indies (1590) he wrote: "The ayre is subtile and piercing, going into the entrailes, and not only men feele this alteration, but also beestes, so as there is no spurre can make them goe forward." The assumed absence of such effects in Europe led Acosta to "holde this place to be one of the highest parts of land in the world, for we mount a wonderful space. And in my opinion, the mountaine of Nevada of Spaine, the Pirenees, and the Alpes of Italie, are as ordinarie houses in regard of hie Towers."[27]

In 1738, during the surveys in which he was collaborating with Charles Maire de la Condamine to measure an arc of meridian at the equator, Pierre Bouguer, by a combination of barometer readings and triangulation, measured the altitude of Chimborazo (20,577) at 3220 toises (20,592 feet).[28] Thenceforth Chimborazo was generally considered the world's highest mountain until the results of Lieutenant W.S. Webb's Himalayan surveys of 1817 became known.[29] These gave to Dhaulagiri (26,810) an altitude of approximately 27,000 feet. (This mighty peak in Nepal again achieved publicity when the French expedition of Maurice Herzog in 1950 sought in vain to climb it before turning to Annapurna.)[30] In 1852 the palm passed to Mt. Everest, after a few years of doubt as to whether Kanchenjunga (28,146), which had been discovered in 1847, or Dhaulagiri were the higher.[31]

In 1852 Mt. Everest was computed to be 29,002 feet high, the most famous single value in the annals of mountain hypsometry. The computation was based upon angle measurements made during the years 1849-50 at six stations on the plains at an average distance of about 110 miles from the mountain. The work was conducted under the direction of the Surveyor General of India, Lieutenant Colonel A.S. Waugh, who later proposed, in a letter to the Royal Geographical Society in London, that the mountain be named for his predecessor, Colonel George Everest. The letter was read in 1857 at a meeting of the Society at which Everest was present. Called upon for comments, he remarked that, while appreciative of the honor, he found the proposal objectionable lest the natives of India, unable to prounce "Everest," might confuse the name with "O'Brien."[32] "Everest," however, has stuck, and the altitude 29,002 feet remained authoritative, though sometimes challenged,[33] for just over a hundred years. In 1952-54, however, the Survey of India carried out comprehensive geodetic operations in Nepal, much nearer the mountain than those of 1849-50 had been. From these a new value of 29,028 feet was computed, "which, it is hoped, is not likely to be in error by more than 10 feet." Mr. Gulatee of the Survey holds that "it will serve no useful purpose to push the accuracy further by more observations, as the seasonal fluctuations of snow on the summit could well be of this order ±10 feet». The older value of 29,002 feet was vague and was computed in a most imcomplete manner."[34]

From time to time since 1852 there have been rumors of yet higher mountains than Everest. Especially during the 1930's and during the Second World War they were reported looming in remote Chinese-Tibetan borderlands,[35] or not far from the Indo-Chinese "Hump,", or in Greenland, or elsewhere, but all have failed of confirmation, and it is now most unlikely that Mt. Everest's supremacy will again be seriously questioned.

SOME EARLY AMERICAN MOUNTAIN MEASUREMENTS

Although Chimborazo lost the "world's championship" in 1817, it continued to be honored as the highest known peak in the Americas until the late twenties, when J.B. Pentland measured the Nevado da Sorata (also known as Illampu, 21,490) and Illimani (21,185) in Bolivia at 25,250 and 24,000 feet respectively. During the voyage of the Beagle the height of Aconcagua (22,835) was measured at 23,200 feet. After Pentland in 1848 had scaled down his estimated altitudes of Sorata and Illimani to less than 21,300 feet, Aconcagua was recognized as the highest known mountain in the Western Hemisphere and is still so regarded.[36] Mt. McKinley was first acclaimed as North America's "champion" early in 1897. William A. Dickey, a prospector, had observed it with a transit the year before from the Chulitna Valley and had estimated the height at over 20,000 feet. Triangulations by U.S. Geological Survey parties in 1898 and 1902 yielded a rounded average of 20,300 feet, which remained the official value until the 1950's, when the Geological Survey and the U.S. Coast and Geodetic Survey jointly agreed upon 20,320.[37] Before 1897 the North American palm had been variously awarded to Mt. St. Elias, Popocatapetl, Orizaba,[38] and a goodly number of peaks in the western parts of the United States and Canada, and at an earlier period to New Hampshire's Mt. Washington, North Carolina's Mt. Mitchell, and even Virginia's Peaks of Otter.

The earliest instrumental mountain measurement of which I have found a record (though without having undertaken any extensive search) is mentioned by Reverend Dr. Jedidiah Morse, the "Father of American Geography." It was a barometric estimate made in 1777 by an unnamed observer of the height of Mt. Wachusett (2006, per U.S.G.S.) in central Massachusetts at 2989 feet.[39] Three years later James Winthrop, Esq., measured the height of the Grand Monadnock (3165) in southwestern New Hampshire at 3254 feet, an overestimate of 2.1 percent. He used "a barometer and the table of corresponding heights in Martin's Philosophia Britanica,"[40] and his result was the most accurate North American mountain measurement (at least to my knowledge) dating from before 1816.

The Rev. Dr. Samuel Williams in 1792 triangulated the altitude of Killington Peak (4241) above the "plain" on which the State House then stood at Rutland, Vermont.[41] His result, 2813 feet (actually about 3640), added to his estimate of the altitude of the plain at 641 feet (actually about 600), gave a total value of 3454 feet. By a similar procedure carried out not later than 1802 the altitude of Table Mountain, now called Table Rock (3157), in western South Carolina was reckoned at 3168 feet above the base and "not less than" 4800 feet above sea level.[42] In 1787 Thomas Jefferson wrote that the Blue Ridge and especially the Peaks of Otter "are thought to be of greater height, measured from their base, than any other in our country, and perhaps in North America" and that the highest peak was "about 4000 feet perpendicular."[43] In 1815 Jefferson himself triangulated the two Peaks of Otter "from a base of $1\frac{1}{2}$ mile on the low grounds of Otter River, distance about four miles from the summits..." Estimating that the base was about 100 feet above tide water, he figured the altitude of the higher peak (4001) at $3203\frac{1}{2}$ feet.[44] The results of these early American triangulations (Killington Peak, 18 percent too low; Peak of Otter, 20 percent too low; Table Rock, 36 percent too high) seem amateurish in comparison with that of the Cassini survey of Mt. Canigou of 1700-01, already mentioned (about 1 percent too high) and especially with that of a triangulation of the Peak of Teide (Teneriffe) carried out by two French astronomers in 1771,[45] which resulted in an underestimate of only about one half of one percent. The American measurements, however, were of mountains in wooded country at considerable distances from the sea, whereas the French surveyors were working in generally open country within the sight of the sea.

The height of Mt. Washington (6288) has probably been more frequently computed than that of any other mountain in the United States. A note published in 1867 lists some two dozen values dating from between 1784 and 1863 and ranging from 6013 up to 12,729 feet.[46] The first ascent of Mt. Washington was made in 1642, and the mountain is known to have been climbed several times between then and 1784.[47] Even so, Robert Rogers, of Rogers' Rangers fame, wrote in 1765 that he had never heard of the White Mountains' having been climbed and that he was inclined to share the Indians' belief that they were inaccessible because of some different quality of air over them.[48]

The first American scientific mountaineering expedition was made to Mt. Washington in 1784 by a party of clergymen and others, including the Rev. Dr. Manasseh Cutler, a distinguished botanist, and the Rev. Dr. Jeremy Belknap, historian of New Hampshire.[49] They took along two barometers, hoping to make simultaneous observations at the foot and top, but one was broken in the ascent. Dr. Cutler estimated the altitude at 9800 feet, which Dr. Belknap thought should be raised to 10,000 or more. Most of the error was due to an estimate of the altitude of the "meadow" at the foot of the mountain (probably at the Glen) at about4300 instead of 1800 feet. A plan to make a "geometrical mensuration of the altitude" went awry because "in the meadow they could not obtain a base of sufficient length, nor see the summit...; and in another place, where these inconveniences were removed, they were prevented by the almost continuous obscuration of the mountains, by clouds." In 1819 the height of Mt. Washington was given as 11,000 feet in Morse's "The American Universal Geography" (7th edition),[50] and the Rev. Dr. Timothy Dwight's calculation of the height at 12,729 feet, on the basis of the distance from which the mountain could be seen from ships at sea, appeared in an edition of his "Travels" as late as 1821.[51] Such generous figures prompted Robert Frost, when cogitating on New Hampshire, to regret his

> Sad accident of having seen
> Our actual mountains given in a map
> Of early times as twice the height they are---
> Ten thousand feet instead of only five.[52]

The first reasonable approximation of the height of Mt. Washington (6225 feet) was made in 1816 by a party of botanists from Boston.[53] In 1851 Professor Arnold Guyot, as part of a program of barometric observations on our eastern mountains that occupied him for several summers, estimated the altitude of Mt. Washington at 6291 feet (a figure that he reduced to 6288 in 1861), and closely comparable results were reached by spirit-levelling carried out in 1853 by Captain T.J. Cram, assistant in the Coast Survey.[54] Thus Mt. Washington's stature was determined more or less definitively within a year or so of the time when Mt. Everest was first recognized as the world's loftiest eminence.

Outside the White Mountains of New Hampshire there are three other localities in the eastern United States where mountains rise to above 5000 feet: central Maine, with its lone summit, Katahdin (5268); the Adirondacks, culminating in Mt. Marcy (5344); and the Southern Appalachians, culminating in Mt. Mitchell (6684).

Morse mentioned Katahdin as "a remarkable high mountain" near the forks of the Penobscot, but he did not name it.[55] The first recorded ascent was made in 1804 by Charles Turner, Jr., a surveyor.[56] Katahdin was rumored to be 6000 to 6400, and 10,000,[57] feet high, until 1820, when the height was estimated barometrically at 5335 feet by Messrs. Loring and Odell, surveyors representing the United States and Great Britain, respectively, "under the the Treaty of Ghent."[58]

In 1838 William C. Redfield (a decade later to serve as the first president of the American Association for the Advancement of Science) published an account of the initial exploration of the fastnesses of the higher Adirondacks, which makes good reading, albeit not quite on a par with Thoreau's narrative of his journey to Katahdin. "The mountains of this region," Redfield wrote, "appear to have almost escaped the notice of geographical writers, and in one of our best gazetteers, that of Darby and Dwight, published in 1833, the elevation of the mountains of Essex county wherein rises Mt. Marcy is stated at one thousand two hundred feet."[59] In August 1836 a party, of which Redfield was a member, carried out a reconnaissance near the headwaters of the Hudson. They took the compass bearings of a mountain seen towering above its neighbors on which Redfield bestowed the name "High Peak of Essex." Later in the year Professor Ebenezer Emmons of the New York State Geological Survey observed the same mountain from the opposite direction (i.e. from the summit of Whiteface some fifteen miles to the northeast). During the following summer Emmons, Redfield, and others made the first ascent of the "High Peak," and measured its altitude barometrically at 5467 feet. In his official report Professor Emmons proposed that the mountain be named for the then Governor of New York, W.L. Marcy,[60] and, as the latter seems to have offered no objection, the name has persisted.

At about the same time Professor Elisha Mitchell of Chapel Hill, North Carolina, made barometric observations of certain of the mountains of the western part of his state. "The Black Mountain," he wrote, "cost me nearly a week's labor fixing upon the peak to be measured and the measurement." This was determined at 6476 feet,[61] later found to be too low when Guyot estimated it barometrically at 6707 feet in 1856 and Major J.C. Turner, the next year, by spirit-levelling arrived at the figure 6711 feet.[62] The highest peak was appropriately named for Professor Mitchell, who wrote in 1837 that the Black Mountain "has some peaks of greater elevation than any point that has hitherto been measured in North America, and is believed to be the highest mountain in the United States"!

Between 1830 and 1864 the Wind River Mountains in Wyoming, certain peaks in central Colorado, Mt. Hood (11,245), and Mt. Shasta (14,162) were all by one writer or another reported as the highest in the United States.[63] In this reconnaissance period many mountains (e.g. Pike's Peak (14,110), Fremont's Peak (13,730), Mt. Lincoln (14,284), Mt Hood,[64] and Mt. Shasta) were arbitrarily assumed to be 18,000 feet high, which caused Professor Brewer to comment: "Why this 18,000 feet should be applied to all mountains I don't know." Mt. Whitney (14,495) has been recognized as the highest mountain in the main part of the United States since Clarence King in 1864 climbed to what he estimated was an altitude of 14,740 feet on its slopes; he thought that the summit was "just over 15,000."[66]

Except as regards Mt. Everest and Mt. McKinley I have not tried to carry the record of even the few mountains that have been considered much beyond the mid-nineteenth century, when the presently accepted heights were first closely approximated. The later progress of mountain hypsometry all over the world, with new techniques and ever-increasing precision, is another story. And, obviously, vastly more could be assembled, digested, and written about all phases of this subject---not only about the hard mathematical and

physical core of the history of mountain measuring but also about the enticing record of fantasies, exploration, adventure, and experimentation that surrounds the core. But this paper is not intended as a meal---merely as a plate of hors d'oeuvres for librarians who love both books and mountains.

NOTES

1 Alexander von Humboldt: Aspects of Nature..., transl. by Mrs. Sabine. Philadelphia, 1849, p. 89.
2 Recent estimates in English feet are thus underlined and, unless otherwise indicated, are derived from "The Columbia Lippincott Gazetteer," New York, 1952.
3 See Bull. American Geogr. Soc., Vols. 39, 1907, p. 108; 41, 1909, p. 365; 42, 1910, p.55.
4 As translated in Helmut De Terra: Humboldt..., New York, 1955, p. 128.
5 Edward Whymper: Travels Amongst the Great Andes of the Equator, New York, 1892, pp. 76-77.
6 A.H. Bent: "Early American Mountaineers," Appalachia, Vol. 13, 1913, pp. 45-67 (ref. on p. 46).
7 S.I. Bailey: "Peruvian Meteorology, 1888-1890, "Annals Astronomical Observatory of Harvard College, Vol. 39, 1899, Part 1, pp. 10-11.
8 See, for example, Humboldt: op. cit., pp. 51-64, 73-94, 217-223, 247-252; also Cosmos, transl. by E.C. Otté, Vol. 1, New York, 1852, pp. 28-33.
9 Florian Cajori: "History of Determinations of the Heights of Mountains," Isis, Vol. 12, 1929, pp. 482-514 (ref. on p. 496.)
10 O. Peschel: Geschichte der Erdkunde..., 2nd edition, edited by Sophus Ruge, Munich, 1877.
11 Knut Lundmark: "Kunskapen om bergens höjder..."with English summary:" Knowledge of the Heights of Mountains," Svensk geogr. årsbok, Vol. 18, 1942, pp. 127-156.
12 Cajori: op. cit., p. 485.
13 Peschel: op. cit., p. 687, n. 2.
14 Peschel: op. cit., pp. 688-697; Cajori: op. cit., pp. 499-512.
15 Peschel: op. cit., p. 702, n. 1.
16 J.S.T. Gehler: Physikalisches Wörterbuch, Vol. 5, Leipzig, 1829, pp. 339-397 (ref. from Cajori: op. cit., p. 504, n. 43.
17 See R. Benini: "Origine, sito, forma, e dimensioni del Monte del Purgatorio e dell'Inferno dantesco," Rendiconti della R. Accad. dei Lincei, Classe di scienze morali, storiche, e filologiche, Ser. 5, Vol. 25, Rome, 1917, pp. 1015-1129.
18 J.A. Lawson: Wanderings in New Guinea, London, 1875. Neither the Journal of the Royal Geographical Society nor Petermanns Mitteilungen deigned to review this book, although the "imaginative fauna of a Captain Lawson" is mentioned in Proc. Royal Geogr. Soc., Vol. 20, 1875-76, p. 352.
19 See Cajori: op. cit., pp. 482-493. In this paragraph ancient estimates have converted into English feet according to the following eqivalents: 1 pace (passus)-4.85 ft.; 1 stadium = 6 plethra (furlongs) = 600 Greek feet = 606.75 English feet.
20 Cajori: op. cit., p. 485.

21 Meteorologica, I, 13 (transl. by E.W. Webster, Oxford, 1923, 350a).
22 See Scipio Claramontius, De altitudine Caucasi, Paris, 1649; Bologna, 1653, I have not seen this work. J.B. Riccioli (Geographiae et hydrographiae reformatae... libri duodecim... Venice, 1672) cites it (p. 202) and in a table (p. 211) gives 125,000 and 1,715,000 paces, respectively, as Chiaramonti's minimus when the sum is in Cancer and maximum when it is Capricorn. According to Riccioli 8 stadia = 1000 paces = 1 Italian mile. I have converted his data into English miles on the basis of 1 stadium = 606.75 feet. My friend, Mr. O.M. Miller of the American Geographical Society, New York, has been kind enough to calcualte that at the summer solstice the sun actually sets only about fifteen minutes later at the summit of Mt. Elbrus (18,481), the highest peak in the Caucasus, than it does at a sea-level horizon in the same latitude; also that a mountain in the latitude of the Caucasus would have to be about 290 miles high for the sun to shine directly on its summit at the summer solstice for two thirds of the total period between sunset and sunrise (or about 101 miles high, if what Aristotle meant was one third of the total period). These calculations took no account of refraction. See also Wilhelm Capelle: Berges-und Wölkenhohen bei griechischen Physikern, in Stoicheia: Studien zur Geschichte des antiken Weltbildes..., Vol. 5, Leipzig and Berlin, 1916, p. 13.
23 Riccioli, op. cit., is a mine of valuable historical and bibliographical data. On pp. 210-211 two tables are presented, one showing what different authorities had believed to be the world's highest mountain and the other showing various estimates by different authorities with regard to the altitudes of some two dozen mountains.
24 Ibid., pp. 203, 211.
25 Ibid., p. 210. For other examples of excessive estimates based at least on a semblance of mathematical reasoning, see Robert Hues: Tractatus de globis, edited by C.R. Markham, London, 1889, pp. 8-14; Cajori, op. cit., pp. 493-494. Cajori here quotes Hues to the effect that Cardan (Geronimo Cardano, 1501-76) and other mathematicians estimate that mountains rise to an altitude of 288 miles; but, read in its context, Hues' statement appears to have reference to the maximum height to which vapor rises.
26 Peschel: op. cit., pp. 426, 697-699.
27 J. de Acosta: Historia natural y moral de las Indias, Seville, 1590, Bk. III, Chap. 9 (Madrid, 1894, Vol. 1, p. 208) Quotation from Edward Grimston's transl, 1604, edited by C.R. Markham, London, 2 vols., 1880, Vol. 1, p. 131.
28 Peschel: op. cit., p. 545.
29 Asiatic Researches, publication of Asiatic Society of Bengal, Vol. 12, London, 1818, p. 276 (as cited by Peschel, op. cit., p. 699, n.1.
30 Maurice Herzog: Annapurna..., transl. from the French. New York, 1953 (there is no mention in this volume of the fact that Dhaulagiri was once believed to be the world's highest peak).
31 Proceedings Royal Geogr. Soc., Vol. 1, 1856-1857, pp. 345-347; Peschel, op. cit. p. 699. Briefwechsel Alexander von Humboldt's mit Heinrich Berghaus... 1825-1858, 2nd edit., Vol. 3, Jena, 1869, p. 109. Alexander von Humboldt: Aspects of Nature..., Mrs. Sabine's transl., p. 88.
32 Proc. Royal Geogr. Soc., Vol. 1, 1856-57, p. 350.
33 See B.L. Gulatee: "Mount Everest: Its Name and Height," Himalayan Journ., Vol. 17, 1952, pp. 131-142.
34 B.L. Gulatee: "The Height of Mount Everest,"...," Survey of India, Technical Paper No. 8, 1954, pp. i-ii.

35 See Geogr. Zeitschrift, Vol. 36, 1930, p. 300; Life, Oct. 3, 1949, pp. 92, 104.
36 Humboldt: op. cit., pp. 63-64, 217-219.
37 The Military Engineer, Vol. 48, 1956, p. 384.
38 J.D. Whitney in "California Proceedings, Vol. 2, p. 219" (thus cited in Amer. Journ. of Sci., 2nd ser., Vol. 37, 1864, pp. 81-82).
39 Jedidiah Morse: The American Universal Geography, Vol. 1, 3rd edit., Boston, 1796, p. 401.
40 Jeremy Belknap: The History of New Hampshire, Vol. 3, Boston, 1813, pp. 28-29.
41 Samuel Williams: The Natural and Civil History of Vermont, Walpole, N.H., 1794, pp. 22-24; Burlington, Vt., Vol. 1, 1809, pp. 27-28.
42 John Drayton: A View of South Carolina, Charleston, 1802, p. 12.
43 Thomas Jefferson: Notes on the State of Virginia, London, 1787, p. 29.
44 Jefferson, op. cit., edited by William Peden, Chapel Hill, N.C., 1955, pp. 262-263.
45 Peschel: op. cit., pp. 687-688.
46 "Note on Diversities in Published Estimates of the Height of Mount Washington, New Hampshire," American Journ. of Sci., 2nd ser., Vol. 44, 1867, pp. 377-379. This note was probably contributed by D.C. Gilman, who was later to become the first President of the Johns Hopkins University. Gilman, like Humboldt, was interested in the history of mountain hypsometry (see J.K. Wright: Geography in the Making: The American Geographical Society, 1851-1951, New York, 1952, pp. 54-55).
47 See Frederick Tuckerman: "Early Visits to the White Mountains," Appalachia, Vol. 15, 1921, pp. 111-127; L.S. Mayo: "The White Mountains in Three Centuries," in his: Three Essays: An Appreciation, Boston, 1948, pp. 23-60.
48 Robert Rogers: A Concise Account of North America, London, 1765, p. 47.
49 Jeremy Belknap: op. cit., pp. 37-39; "Description of the White Mountains," Trans. Amer. Philosophical Soc., Vol. 2, 1786, pp. 42-49; "Journal of a Tour of the White Mountains in July 1874...", Mass. Historical Soc., Boston, 1876 (pamphlet)..
50 Morse: op. cit., Vol. 1, 6th edition, 1812, p. 231; 7th edition, 1819, p. 257.
51 Timothy Dwight: Travels in New England and New York, Vol. 2, New Haven, 1821, p. 164.
52 Robert Frost: "New Hampshire," in: Complete Poems..., New York (Holt), 1949, p. 209.
53 Jacob Bigelow: "Some Account of the White Mountains of New Hampshire, "New Engl. Journ. of Medicine and Surgery, Vol. 5, 1816, pp. 321-358.
54 Arnold Guyot: "On the Appalachian Mountain System," Amer. Journal of Sci., 2nd ser., Vol. 31, 1861, pp. 157-187; Report of the Superintendent of the U.S. Coast Survey, 1853, p. 29; 1854, p. 40. C.H. Hitchcock: The Geology of New Hampshire, Vol. 1, Concord, 1874, pp. 64-69.
55 Morse: op. cit., Vol. 1, 1796, p. 383.
56 Collections Mass. Historical Soc., 2nd Ser., Vol. 8, 1826, pp. 112-116.
57 T.G. Bradford and S.G. Goodrich: A Universal Illustrated Atlas, Boston, 1842, p. 35.
58 Moses Greenleaf: A Survey of the State of Maine, Portland, 1829, p. 47.
59 W.C. Redfield: "Some Account of Two Visits to the Mountains in Essex County, New York, in the Years 1836 and 1837...," Amer. Journ. of Sci., 1st ser., Vol. 33, 1838, pp. 301-323 (ref. on p. 322-323). Before 1837 the

Catskills were regarded as the highest mountains in New York State (ibid., p. 314).

60 "Report of E. Emmons, Geologist...," in: State of New York No. 200, In Assembly, Feb. 20, 1838, "Communication from the Governor Relative to the Geological Survey of the State," pp. 240-250.

61 E. Mitchell; "Notice of the Height of Mountains in North Carolina," Amer. Journ. of Sci., 1st ser., Vol. 35, 1839, pp. 377-380.

62 Guyot: op. cit., pp. 159-161.

63 See D.C. Gilman: "The Last Ten Years of Geographical Work in this Country," Journ. Amer. Geogr. Soc., Vol. 3, 1873, pp. 111-133; esp. pp. 122-133; W.H. Brewer: "Explorations in the Rocky Mountains and the High Peaks of Colorado," ibid., pp. 193-215 (esp. pp. 196-204).

64 Mt. Hood (11,245) "was formerly called the 'monarch of American mountains' ---16,000, 17,000, and 18,000 feet high, of which the latter number was by far the most popular belief; and, indeed, one called it 21,000 feet high..." Brewer, op. cit., p. 197.

65 Ibid., p. 203.

66 Gilman: op. cit., p. 132.

AFRICA: CLIMATE

The Climatological Atlas of Africa. The first joint project undertaken under the auspices of the C.C.T.A. (Technical Co-operation in Africa South of the Sahara), and financed by the Member Governments of the Scientific Council for Africa South of the Sahara. The responsibility for the preliminary work and for the co-operation of the African meteorological services was confided to Dr. T.E.W. Schuman, Director of the Union Weather Bureau at Pretoria, and Dr. S.P. Jackson of the University of Witwatersrand) was named editor. The atlas will include sixty-four maps in color on a black and white or grey ground, each map measuring 21 x 28 inches. Scales recommended are 1:10,000,000 or appropriate fractions or multiples thereof. (Source: pp. 136-139, AFRICAN SOILS, Vol. IV, No. 2, 1956, published by the Inter-African Bureau for Soils and Rural Economy, C.C.T.A., London)

MAPPING IN CUBA

Collaborative mapping in Cuba. An article in THE MILITARY ENGINEER for September-October 1957, calls attention to an ambitious scheme occurring in Cuba. From a program initiated in 1946 through an agreement between the United States and Cuba, financial assistance being provided by the United States, geodetic control was completed, gravity and magnetic stations established, and aerial photography completed. For the basic program, condensed now into the next two years, considerable additional field control will be established prior to actual compilation and reproduction of the 1:50,000 scale maps planned to cover all of Cuba. The Institute Cubana de Cartografia y Catastro is directing this program, with the assistance of the Inter American Geodetic Survey of the Corps of Engineers.

GEOLOGY CLASSICS FROM THE GOVERNMENT PRINTING OFFICE

by

Edward P. Thatcher

In the literature of American geology there are many excellent studies contained in the documents of the United States government. Among these are several which may be properly termed "classic." By "classic" I mean papers which, because they greatly advanced development of a concept, have become direction posts along the road geology has cut in its development toward a mature science. By "classic" I signify also that they are without peers in the literature of geology when considerd for organization of facts, literary construction, and appealing, clear style. In brief, they are magnificent pieces of scientific reporting, being among the great books of American geology.

The earth sciences are still very significant in American culture. Meteorology and physical geology are very important to many, including librarians, who work in the western third of our nation and in other areas where natural resources of the earth have been or are now a major factor in local economies. Any librarian is subject to questions by prospectors, students, "rock hound" hobbyists and others wishing general information. Two of many questions placed to me recently in which a previous knowledge of geology saved the time of the patron, and anxiety for both of us, were: "Where may I find a picture of a sluice box?" and "What are the geologic and geographic relationships of the Blue Ridge Mountains and the Great Valley of the Appalachian?" My brief acquaintance with history of gold mining and with physiography enabled us to make a rapid start toward the best authorities.

In each of these instances the superbly indexed publications of the United States Geological Survey were produced and found satisfactory. Its series possess the authority of an overdue notice, especially with grizzled prospectors, who know more about beach placers and pegmatite than they do private authorities, such as Emmons, Bateman, or Ries.

For the librarian and layman the great books in geology from the United States documents hold abundant information in beautifully organized form. Many of the geological papers of yesterday and the present day manifest very well the logical systematic approach of the field geologist to his problem; further, they are evidence of inductive and deductive reasoning of the reporter. This is not encountered in the usual reading of the librarian.

The papers here discussed are suggested as good reading for pleasure and information on many of the concepts of modern descriptive geology. They are selected as examples of documents containing excellent scientific writing, a wealth of illustration and each as an introduction to its author who is as well known for his reporting of field work as for his geologic knowledge.

Israel Cook Russell — Subaerial decay of rocks and the origin of the red color of certain formations. United States Geological Survey, Bulletin 52: 1-65, Washington, 1889.

House Miscellaneous Documents, 50th Congress, 2nd session, 1888-1889, v. 11, Pt. 2: 533-598.

Rock decay, or chemical weathering, is a process by which soils develop, and is a contributing cause of land sculpture. Two very significant and elementary principles in geology are elaborated by Russell: (1) weathering of igneous rocks is the initial process in the derivation of many sedimentary rocks, and, (2) therefore, the nature of the derived rocks is determined by the climate prevailing during soil formation.

Biographical sketches of I.C. Russell [1, 2] contain references to his major written work; the earlier of these were published by the United States Geological Survey. After the age of forty he taught at the University of Michigan and wrote authoritative semi-popular volumes on rivers, glaciers, lakes, and volcanoes.

Thomas Chrowder Chamberlin — The requisite and qualifying conditions of artesian wells. United States Geological Survey, Fifth Annual Report: 125-173, 1883-1884.

House Executive Documents, 48th Congress, 2nd session, 1884-1885, v. 13.

Artesian flow of water through porous sedimentary rocks has been the greatest source of this precious resource for the farms and ranches of the plains and glaciated prairies of the vast midwest. This instructive writing by Chamberlin makes excellent use of abundant diagrams in order to aid the reader to comprehend the geologic problems and complexities surrounding this earliest dependable supply of the homesteaders' water.

T.C. Chamberlin[3, 2] was both a state geologist (Illinois) and academic teacher during a long career. He is well known in the scientific world as the author of a theory for the origin of the solar system.

John Wesley Powell — Exploration of the Colorado River of the West and its tributaries explored in 1869, 1870, 1871 and 1872, under the direction of the Secretary of the Smithsonian Institution. 1-214, 1875.

House Miscellaneous Document 300, 43rd Congress, 1st session, 1875.

As many superlatives might certainly be used for the vivid writing of the colorful Major Powell as for his subject, the canyons of the Colorado and Green Rivers. This is at once a travelogue, adventure story and a scientific report of geology and ethnology. Powell's report is thrilling in description of boat-splintering in rapids, realistic in accounts of Indians from the high plateaus of Arizona; and, above all, Powell's writing possesses an exuberance which lends the reader an urgency to see the magnificence of the canyon country.

The later director of the United States Geological Survey and of the Bureau of Fthnology brought into clear focus the concept of stream adjustment to rock strata and land forms. This is likewise a superb source for the understanding of concepts and terminology of rock deformation, for example, faulting.

The recent biography of Major Powell by Stegner[4] is an excellent complementary study.

Grove Karl Gilbert Report on the geology of the Henry Mountains. United States Geographical and Geological Survey of the Rocky Mountain region, 1-160, 1877.

Antecedents to the present United States Geological Survey were several concurrent surveys of western territories. G.K. Gilbert, surely one of the most exacting field geologists of all time was directed in Utah during the field seasons of 1875 and 1876 by Major Powell. Powell with his explorations of the Colorado River system and Gilbert with major efforts on the geologic history of Great Salt Lake and the Henry Mountains brought the huge area of the Colorado Plateau into the thinking of geologists long before the search for uranium minerals.

Gilbert is my choice for the most lucid and analytical reporter of all scientific history. The Henry Mountains report contributes well to the understanding of the reader for geological concepts of erosion, stream adjustment, rock flexure and most specifically, toward knowledge of intrusion and extrusion of rock masses. For the non-geologist it is not alone a text of description but the best example in geological literature of scientific method of thinking. Steps in scientific thinking including hypothesis formulation, induction, and deduction properly belong to all fields of knowledge in which problem solving is peculiar.

G.K. Gilbert[5, 2] is known among geologists for many brilliant reports contained in the series of the United States Geological Survey; this one, however, on the little-known, seldom-visited Henry Mountains will remain his greatest contribution, because it is a contribution to learning.

Charles Richard Van Hise A treatise on metamorphism. United States Geological Survey, Monograph 47: 1-1243, 1904.

With over 1200 pages of text this is in the true sense of the word, a monograph. As such, it is useful as a reference, or for brief nibbling at the great amount of information contained. However consumed, with it, one is introduced to still another series of the Geological Survey, another major area of geology and to a simple clear exposition. The life work of Van Hise[2] and of T.C. Chamberlin were, except for their geological specialities, quite parallel. Both taught at the Universities of Chicago and Wisconsin, and each was a president of the latter state university.

An outstanding feature of this monograph is its development of subject from simple to complex in "n" quantity of steps. Rock terms are simply explained. Since alteration of minerals and forces of decomposition are involved in the subject of metamorphosis and ore deposit, some general inorgainc chemistry is well employed in the instructive story.

Francois Matthes Geologic history of the Yosemite Valley. United States Geological Survey. Professional Paper 160: 1-129, 1930.

Matthes has in this paper given geologists and other travelers an introduction to the geologic grandeur of the Yosemite Valley and a thorough discussion of the principles of glacial geology. The principles are made clear by frequent reference to specific features which are well illustrated by photographs, diagrams, and maps. The story of glacial studies, full of controversy and colorful figures, is a fascinating one, for many American geologists and wanderers, as John Muir, played major roles.

Again in this selection the value, and surely the beauty, lies in its clearly presented evidence and logical, well-supported conclusions. Matthes has constructed one of the greatest landmarks in all geological literature. His posthumous book on the Yosemite Valley[6] contains a brief summary of the author's life, and magnificent products of his photographic skill.

Each of the selected geological papers annotated here introduces a distinct area of physical geology. If selections from still other areas of earth science were considered, more of the writing of Cook, Gilbert, Van Hise or Chamberlin would be included. Thus, also introduced are six versatile contributors to American geology, each a master of English expression in science reporting.

References Cited

[1]Journal of Geology 14: 663-667, 1906.
[2]Dictionary of American Biography, Scribner 1928-1944.
[3]National Academy of Sciences, Biographical Memoirs 15: 307-407, 1934.
[4]Stegner, Wallace. Beyond the hundredth meridian: John Wesley Powell and the second opening of the West. Boston, Houghton Mifflin, 1954.
[5]National Academy of Sciences, Biographical memoirs 21 (5): 1-303, 1927.
[6]Matthes, F.E. The incomparable valley: a geologic interpretation of the Yosemite. Berkeley, University of California Press, 1950.

MEETINGS

Valuable consecutive meetings and a co-exhibit will be held at the Shoreham Hotel, Washington, D.C. as follows:

American Congress on Surveying and Mapping--
18th Annual Meeting, March 23-26.

American Society of Photogrammetry--
24th Annual Meeting, March 26-29.

NEW YORK GROUP

The second meeting of the Geography and Map Group was held in the Auditorium of the Donnell Regional Library on January 7. With the current interest in the USSR, we were fortunate in being able to see the kodachrome slides and have the enthusiastic and interesting account of her recent visit presented by Miss Fannie Simon. A member of our Group and Librarian and Associate Editor of McCall's Magazine, Miss Simon visited Leningrad, Kiev, and Moscow this past summer, arriving at the Leningrad airport as a lone passenger on a plane from Helsinki. During her stay in the USSR, Miss Simon had a guide and limousine six hours each day; the remainder of the time she was on her own.

The pictures of the huge, beautiful, impressive Leningrad subways were excellent, as were those taken at the stadium of the festival in honor of the 250th anniversary of the founding of the city by Peter the Great. The demonstrations, always perfectly executed, were somewhat comparable to those between halves at a big American football game, but on a much larger scale, and in an exceptionally large stadium. The view of the Hermitage Museum was lovely and made some of us wish for the opportunity to see the treasures housed there; again, this, too, was larger than imagined.

Miss Simon not only showed us well-known buildings, such as museums, universities, libraries, and churches, and in Moscow, parts of the Kremlin, Red Square, GUM, etc., but she tried to show the people who, in general, were not badly dressed. She showed them in parks, feeding pigeons, looking in store windows, going to church, buying soft drinks, taking children to a day nursery (which she visited after following some of the mothers with children), cleaning streets, at work on a collective farm, etc.

During her stay in Moscow, Miss Simon attended the ballet or the opera every night. Here, too, a visit to a private home was arranged and she had tea with the family. On her visit to the American Embassy she was given a list of things which could not be photographed; however, at no time was she refused permission to photograph what she wished, and she had already included some bridges, etc. on the list.

After the slides, during a question and discussion period, Miss Simon stated that she was not followed during the time each day she was out alone; however, she knew no one in the USSR and had no friends nor relatives there. She believes that we have underestimated the USSR. She also believes that visits of more middle class Americans to the USSR should be encouraged for the development of greater understanding between the people of the two countries.

(Maud D. Cole)

U.S.G.S. RECORD

During October 1957, 194 new or revised topographic quadrangle maps were published by the Geological Survey. This is a new high record for one month that can best be appreciated by comparison with the figure of about 200 new maps per year, which was the average production just prior to World War II.

WASHINGTON GROUP

A joint meeting of the Geography and Map and the Transportation Groups was constituted a Chapter meeting for October 22, 1957, and was well attended. Mr. Harry Torrington of the U.S. Department of Commerce and Chairman of the Committee for the Facilitation of Air Transport spoke on his Committee's very active interest in freeing world air travel from the red tape that has made air transportation internationally an excesively difficult procedure for both traveller and company. A color film, "Transpolar Flight," on a trans-Arctic route from Copenhagen to the Pacific was shown by courtesy of the Scandinavian Airlines System.

The Washington Chapter Geography and Map Group held its first non-joint meeting of the season at the Library of Congress January 9 when a panel of three discussed "Map Exhibits." Mr. Emory Hall, Retired Chief of Information Services of the Aeronautical Chart and Information Center, Dr. Walter Ristow, Asst. Chief of the Map Division, Library of Congress, and Mr. Willeroy Wells, General Manager of Art Designers Inc. laid down basic principles of exhibit and gave practical suggestions of benefit not only to map exhibitors but to exhibitors in general. Specifically discussed were "The Construction Problem," "The Psychology of Color," and "Contents for an Exhibit." All three put emphasis on simplicity in message, design, and structure.

Meetings are now planned for March and May.

(Ralph L. Thompson)

PLANNING BIBLIOGRAPHIES

Librarians of planning libraries met during sessions of the American Institute of Planners in Chicago in October and established a Clearing House Center, located presently at the University of California, Berkeley. The Center will serve as a clearing house for a system of exchange bibliographies. Bibliographies on any subject which one of the cooperating librarians feels is important in the work, research, or teaching program of the agency or institution for which he labors will be submitted to the Center for reproduction and distribution. For the present, only cooperating members will receive copies. Later they may be available by subscription.

Research Digest is the title of a semi-annual publication sponsored by the Urban Planning Research Group. The Digest is prepared and distributed by the Department of City Planning and Landscape Architecture of the University of Illinois, Urbana, and is available for $2.00 a year. Volume 4, number 2, November 1957, has just been issued. Twenty-four planning research projects underway or recently completed at ten institutions are described. Several, including five reported from the University of Chicago, are in the Department of Geography. Many others are certain to be of interest to geographers.

PERSONAL NOTES

Nat Abelson, Map Librarian at the United Nations is pictured in his collection in a picture illustrating an article on the United Nations in the January 1958 issue of the Christian Advocate, a Methodist publication.

Marie Tremaine is the author of "Polar Research in Government Libraries" in the December 1957 Special Libraries. Miss Tremaine, Director, Bibliography project, Arctic Institute of North America, in Washington, presented the paper at the Geography and Map Division dinner meeting in Hanover May 31. A description of the Arctic Bibliography project appeared in the Geography and Map Division Bulletin, no. 18, December 1954.

Lawrence C. Wroth, distinguished bibliographer and cartobibliographer, retired on July 1, 1957, as Librarian of the John Carter Brown Library, Providence.

Rose Z. Sellers organized and chaired the first Institute on Librarianship, sponsored by the New York Library Club and held at the Carnegie Endowment for International Peace on Saturday, December 14. Object - to sell librarianship to college students and vocational guidance personnel. Despite the subway strike, 100 attended, representing 31 colleges in the metropolitan area and including several members from the New Jersey Chapter's Recruiting Committee. The proceedings were recorded by WNYC.

Walter W. Ristow, Acting Chief of the Map Division is the author of an article entitled "Journalistic Cartography" in the October-December 1957 issue of Surveying and Mapping. The article reviews and analyzes cartographic illustrations in American newspapers, general magazines, and news weeklies during the last quarter-century. Especial attention is given to the contributions of such well-known journalistic cartographers as Robert M. Chapin, Jr., Richard Edes Harrison, and Antonio Petruccelli.

A limited number of reprints of Dr. Ristow's article are available upon request to the Map Division. (L.C. Information Bulletin)

MAPS IN LITERARY HISTORY

Cartography as an aid to the literary scholar is the title of a recent paper by Mr. Paul W. Child, Jr., graduate student in English at Boston College. The use made of maps by literary historians in order to interpret the work and life of various authors is described. Copies of the paper are available from the author, 17 Greymere Road, Brighton 35, Massachusetts.

ANTARCTICA

A map of Antarctica showing the status of mapping appears on page 59, THE MILITARY ENGINEER for January-February 1958, while the U.S. Geological Survey supplies descriptive text on the history and progress on mapping.

Coffman, F.L. 1001 lost, buried or sunken treasures; facts for treasure hunters. N.Y., Nelson, 1957. 277p. $5.00.

The author's title has an air of intrigue about it which he attempts to maintain throughout the book. As with many works of this kind, the tempting idea that real treasures are just lying in wait for us to discover them is constantly dangled in front of the reader. No real secrets are given to us, however. Instead, the book is a compilation of library data plus a few personal experiences.

Not all of the 1001 locations deserve to be called "treasure" sites. For example, many of them consist of lost mines or sunken cargo ships which carried only coal or a similar commodity. Notwithstanding some of these limitations, the tales of a few of the world's great lost treasures absorb all of the reader's interests.

Coffman, F.L. Atlas of treasure maps. N.Y., Nelson, c.1952, 1957. 124p. $10.00.

This atlas is designed to accompany the previously discussed book. It is composed almost entirely of navigation charts from the U.S. Coast and Geodetic Survey. On these the so-called treasure locations have been very roughly plotted. Since the Coast and Geodetic Survey charts show all shoals and partially submerged wrecks, much of Mr. Coffman's work was already done for him on the base maps. In this atlas treasure sites are not described; one needs to read the companion book by Mr. Coffman (1001...Treasures) for any sort of description of them.

William J. Smole
Kent State University

Palmer, R.R., ed. Rand McNally Atlas of world history. Chicago, Rand McNally, 1957. 216p. $5.00.

The librarian about to buy a historical atlas should read the preface to this one. Some, but not all, of its novel conceptions are set forth there. They are attractive.

The phrase, "world history", gets thrown around a lot. This atlas is probably the closest thing I have seen to a genuine "world" approach. Maps, of course, have an especial advantage in bringing together events that are taking place simultaneously in many widely separated places. Their use here to do just that is eminently successful (cf. "Greek Civilization", p. 32; "Civilization of the Roman Empire", p. 37; "Expansion of Christianity", and "Medieval Commerce", both p. 53; "World After 1763", p. 80, as examples. There are many more like these.)

Some rare and provocative subjects are treated: there are, for instance, maps conveying a good idea of European civilization century-by-century, through the device of location and dating important persons and institutions.

Similarly there are maps of "The Hanse Towns", "The Operations of the Medici and Fuggers", "Established Churches ... About 1600", "Languages of Europe", several maps depicting the progress of the industrial revolution, and a good number of maps devoted to affairs in China, India, and other parts of Asia from early times. There is a good map of Africa before the partitions.

To accompany the maps there are alternating pages of text written by six recognized specialists. These brief but informative and accurate sections greatly enhance the value of the maps. In the back of the volume are seven pages of tables presenting for various periods of the past estimates of population for selected cities and countries, mortality, disease, and migration figures, statistics on commodity production and on transportation. The index covers not only place-names, but also ethnic and state names, explorers' routes, and the like.

This atlas is a remarkably successful one. It goes a long way toward a genuine "world" approach to world history, and at the same time treats of more than political history. Its maps of economic and social subjects are outstanding.

The book is simple enough to use as a teaching aid, but not so oversimplified as to be useless for reference. It will be the best available source (and a good one) on many subjects for some time. One hopes that more maps and more good sections of text will be added from time to time, following the spirit of the present volume, as new editions come along.

Philip L. Wagner
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LET'S ALL GO

"The plans of mice and men..." Ena Yonge reports that her grandiose scheme of encircling the globe has had to be postponed for a year, and instead of taking off in February 1958, she hopes to lead a valient band to Asia in February or March of 1959. More notice of this change of plans later. In the meantime, she is organizing a 28-day jaunt to Europe, to include 12 days touring the U.S.S.R. Fannie Simon had such an exhilarating visit to Russia in June 1957, that she is inspiring her rapt audiences to go and do likewise - hence this Yonge Tour of July-August 1958. Starting date, July 6th, by Scandinavian Airlines, stopping in Copenhagen for 2 days, Helsinki for 1 day, USSR July 20-August 1st. Then fly out to Munich for a couple of days (Munich is celebrating its 800th anniversary), onto Amsterdam, Brussels (for the World's Fair), and wind up in Paris. The tour ends in Paris, but the fair allows stop-over priviliges in London, and arrangements can be made for those wishing to spend more time in Europe. Overall cost, $1571.00. Contact Ena Yonge at the American Geographical Society, Broadway at 156th Street, New York 32, N.Y. Allow at least 2 months for a Russian visa, so make up your minds soon! Owing to Russian regulations, reservations must be in hand by April 1st, with deposit of 100.00, plus passport and filled in Russian visitors' application questionnaire. This will be sent on request.

NEW BOOKS

Compiled by Bill M. Woods

Bibliographie Cartographique Internationale vol. 8, 1955. Paris, 1957. 702p. $7.00. Published under the auspices of the French National Committee on Geography and the International Geographical Union the 1955 volume includes 2165 separate notes on map publications. Available from the American Geographical Society.

Dickson, B.T., editor. Guide book to research data for arid zone development. N.Y., UNESCO c1957. 191p. illus., maps, diagrs. (Arid zone research, 9) $6.30. Available from Columbia University Press.

General Drafting Company, Inc. The story of IGY, International Geophysical Year and the earth satellites. N.Y. Educational Relations Division, Esso Standard Oil Co., 1957. 31p. illus., maps.

_____The story of roads. 15p. illus., maps. Both booklets, similiar to the earlier The Story of Maps, are intended for the young reader. Available from Division and Refinery offices of Esso Standard in Boston, Baltimore, Pittsburgh, Richmond, New Orleans and elsewhere. (15 West 51st Street, N.Y. 19)

National Research Council, Highway Research Board. Agricultural soil maps, status, July 1957. Washington, National Academy of Sciences, 1957. (Highway Research Board Bulletin 22-R; NRC-NAS Publication 543) Revised edition of an invaluable index to U.S. soils maps.

The Official atlas of the Civil War. To be published March 31, 1958. 175 plates. $40.00. Pre-publication price $34.95. Reproduction of the official cartographic records of the Federal and Confederate armies as originally published in 1891-95. Includes an introduction by Henry Steele Commanger. Available from Abraham Lincoln Book Shop, 18 E. Chestnut, Chicago 11.

Perloff, H.S. Education for planning: city, state and regional. Baltimore, Johns Hopkins Press c1957. 199p. diagrs. (Resources for the Future, Inc. publication) $3.50. Three essays discussing the intellectual, practical, and philosophical basis for the education of city and regional planners.

Spectorsky, Auguste C., ed. The book of the earth; being a collection of writings about the earth in all its aspects. N.Y., Appleton-Century-Crofts c1957. 488p. illus. $12.50. Anthology of some seventy devoted to man's enounters and reaction to the soil on which he lives.

United Nations Dept. of Economic and Social Affairs. International map of the World on the millionth scale. Report for 1955. N.Y. c1957. 84p. fold. map. (ST/ECA/SER.D/1) 80¢. Latest report listing 1:1,000,000 sheets. Valuable summary. (Sales no. : 1957. I. 5)

NEW MAPS

Compiled by Charles W. Buffum, Ina Yonge, and others.

ADEN. Aden Protectorate. 1:500,000. Printed by the Geographical Section, General Staff. [London] Royal Geographical Society, 1957. (2 sheets. General map.)

AFRICA. Political Africa. Edited by Benjamin E. Thomas. Scale ca. 1:7,200,000. Chicago, Denoyer-Geppert Co., 1957. (map J4).

AFRICA. Rhodesia and Nyasaland. Mean Annual Temperature. 1:5,000,000. Salisbury, Director of Meteorological Services, 1957.

ALGERIA. Irg Chech-Tanezrouft. Carte Topographique et Itineraires. 1:500,000. [Paris] Bureau de Recherches de Petrol, 1956. (Shows dune area, oases, routes, and pertoleum geology.)

ARKANSAS. Little Rock and vicinity. 1954. Scale 1:24,000. Washington, U.S. Geological Survey, 1957.

ASIA. Political Asia. Scale ca. 1:9,000,000. Chicago, Denoyer-Geppert Co., 1957. (Map J3).

ATLANTIC OCEAN. Physiographic diagram, Atlantic Ocena (Sheet 1). [Scale ca. 1:5,500,000] By Bruce C. Heezen and Marie Tharp. Reprinted by permission on the Lamont Geological Observatory (Columbia University). [n.p.] Bruce C. Heezen, c1957. col. map 75 x 141 cm. (29 x 57 inches). Relief shown pictorially [landforms] and by spot depths. "Vertical exaggeration about 20:1."

AUSTRALIA. Map of Victoria Showing Pastoral Stations. 1:633,600. Sydney, H.E.C. Robinson, [1957].

BRAZIL. Mapa do Estado do Parana. 1:650,000. [Curitiba] Departamento de Geografia, Terras e Colonizaçao, Divisao de Geografia, 1957.

BRAZIL. Planta de Curitiba (abrangendo os barrios, lotcamentos e zonas suburbana). 1:20,000. [Curitiba] Sociedade Comercial e Representaçoes Graficos Ltda., 1957. (Has street index and index to important buildings.)

CANADA. Location Map of Canada's Pulp and Paper Mills... no scale. Gardenvale, Ont., Pulp and Paper Magazine of Canada, 1956.

CANADA. Mineral Map of Province of Ontario. 1:1,267,200. [Toronto] Department of Mines, 1957. (Map No. 1957-A. Has list of principal mines and mineral occurances.)

CANADA. The National Capital - Ottawa and Environs... ca. 1:26,500. 4th ed. [Ottawa] Federal District Commission, 1957. (Has street index on verso.)

CANADA. Location of Mines and Mineral Occurances of Newfoundland. ⟨St. Johns⟩ Department of Mines and Resources, Mines Branch ⟨1957?⟩ (Atlas.)

COLORADO. State of Colorado, compiled from the official records of the Bureau of Land Management and other sources. Scale ⟨1:760,320⟩ 1 inch = 12 miles. Compiled and drawn by T.W. Schlitt, B.L.M. Area 3, Denver. ⟨Washington⟩ U.S. Bureau of Land Management, 1957. col. map (31 x 36 inches).

COSTA RICA. Mapa Politico de Costa Rica. Edicion Escolar Provisional 1956. 1:1,000,000. San Jose, Instituto Geografico de Costa Rica, 1956.

CYPRUS. Cyprus. 1:506,880. ⟨Nicosia⟩ Land Registration and Survey Department of Cyprus, 1956. (Shows state forests, prescribed villages, village fuel grounds, and tree planting areas.)

DOMINICAN REPUBLIC. Mapa de la Republic Dominicana. ca.1:570,000. ⟨Ciudad Trujillo⟩ Instituto Cartografico Militar, 1957.

FINLAND. Suomen Postikarta, Postkarta över Finland. 1:750,000. Helsinki, Maanmitthaushallituksen Kartografinen Toimisto, 1956. (Shows post routes, post offices, districts, etc.)

FRANCE. Réseaux de Transport d'Énergie Électrique de France. Zones d'Exploitation des Centres Régionaux. 1:1,000,000. ⟨Paris⟩ l'Électricité de France, 1 Jan. 1957.

FRANCE. France - Camping - Yachting - Canoe - Kayak. 1:1,400,000. ⟨Paris⟩ Touring Club de France, 1957. (Shows facilities for the above activities.)

GERMANY. Karte der Gemeindegrenzen des Landes Rheinland-Pfalz. 1:200,000. ⟨Koblenz?⟩ Landesvermessungsamt für des Land Rheinland-Pfalz, 1957. (2 sheets. Minor civil divisions map.)

GERMANY. QUAX-Atlas für Luftfahrer. Frankfurt a?M, QUAX, 1956. (Sectional maps with aeronautical information overprinted.)

GERMANY. Klima-atlas von Rheinland-Pfalz. Bad Kissingen, Deutscher Wetterdienst, 1957. (77 loose leaf maps in portfolio.)

GREAT BRITAIN. Northern Ireland. 1:253,440. Belfast, Ordnance Survey of Northern Ireland, 1957.

GREAT BRITAIN. The Norfolk Broads and Rivers. ca.1:42,000. London, George Philip & Son. Lts., 1957. (Copyrighted by Edward Stanford, Ltd. Map contains data relating to local navigation and boating in the area.)

GUATEMALA. Mapa de Turismo de la Ciudad Antigua Guatemala. 1:7,500. Guatemala City, Direccion General de Cartografia, 1956. (with index to buildings and ruins.)

INDIA. Provincial Map of "Assam" - Political. 1:1,000,000. New Delhi, Clifton & Company ⟨1957?⟩ (Note: This company also has published state maps.)

IRAQ. (Areas of Forests in Iraq) ca.1:1,760,000. ⌈Baghdad, Ministry of Agriculture, Directorate General of Forest and Trees⌋ 1954. (Title in Arabia. Legend in English and Arabic.)

IRAQ. Map of Ancient Sites of Iraq. 1:1,000,000. Baghdad, Directorate General of Antiquities, 1954. (2 sheets).

IRAQ. A Provisional Land Use Map of Iraq. 1:1,000,000. Baghdad, Department of Geography, College of Arts and Science, 1954. (In English and Arabic. 2 sheets.)

ISRAEL. ...Haifa Region. 1:33,333. ⌈Tel Aviv?⌋ Zv. Friedlander, 1958. (In Hebrew and English).

ITALY. Plainmetria di Milano. 1:8,500. Rome, Instituto Geografico Visceglia, ⌈1957⌋ (2 sheets).

ITALY. Carta delle Ferrovie d'Italie... 1:1,000,000. Edited by the German-Italian Freight Tarrif Union. ⌈Wuppertal⌋ Bundesbahndirektion Wuppertal, 1956.

JAPAN. Japan, Population. 1:800,000. ⌈Chiba⌋ Geographical Survey Institute, 1957. (3 sheets.)

JAPAN. (Toyama) 1:10,000. ⌈Chiba⌋ Geographical Survey Institute, May 1957. (City plan of Toyama).

JAPAN. Japanese National Railways. 1:1,200,000. ⌈Tokyo, Japan National Railways⌋ 1957. (In English).

KENYA. Kenya - Political and General. 1:1,000,000. 2nd ed. ⌈Nairobi⌋ Survey of Kenya, 1957. (2 sheets).

MAURITIUS. Mauritius. ca.1:200,000. ⌈Port Louis⌋ Information Office ⌈1957⌋.

MADAGASCAR. Madagascar et Dépendances. Carte Économique. 1:1,500,000. ⌈Tananarive⌋ Service Geographique de Madagascar, 1954. (2 sheets).

MADAGASCAR. Madagascar et Comores. Organisation Adminstrative. 1:2,500,000. Dressé et publié par la Service Geographique de Madagascar en 1950. ⌈Tananarive⌋ March 1956. (Political divisions).

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UNITED STATES. General tribal locations, American Indians after 1500. Names of tribes show earliest known locations. Subsequent locations dated. Present location on reservations indicated if known. ⌈ca. 1:5,000,000. n.p.⌉ Ralph W. Oakley, c1957. Blue line print.

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UNITED STATES, SOUTHWEST. Map of the Indian Country in Arizona, New Mexico, Utah & Colorado. Scale 1:820,500. Harry P. Pflum, cartographic manager. Cartography by R.J. Newhouse; relief by F.M. Burke; Los Angeles, Automobile Club of Southern California ⌈1957⌉ (Map no. 2292) Title on outside when folded: Indian Country. On verso: Index.--Hopi Indian villages ⌈ca.1:212,000⌉ Indian reservations, and National parks are emphasized.

UNITED STATES. NEMA industrial region map--33 regions. Scale ⌈ca.1:5,500,000⌉ New York, National Electric Manufacturers Association, 1957. An "exploded" map, each region subdivided into counties. "Copies of the map and a directory listing county content of each region may be purchased from the NEMA Statistical Department."

UNITED STATES. NEMA industrial trading area map: 121 areas. Scale ⌈ca.1:5,000,000⌉ Shows the boundaries, names, and code numbers of the 121 areas comprising the NEMA industrial trading area system. The combinations of the industrial areas shown in the "exploded" sections on the map refer to the NEMA pattern of 33 industrial regions. New York, National Electrical Manufacturers Association, 1957.

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WORLD. Goode's World Atlas. Physical, political & economic. By J. Paul Goode. Edited by Edward B. Espenshade, Jr. 10th ed. Rand McNally & Company, Chicago, 1957 (XVI & 271 pp. Formerly Goode's School Atlas).

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WORLD. Pacts et accords de sécurité dans le monde, juin 1957. Laboratoire de cartographie de l'École pratique des hautes études de politique etrangère ⟨1957⟩ Scale ca.1:30,000,000. Marginal maps: Accords avec les U.S.A. ⟨ 8 maps⟩--Accords europeens ⟨7 maps⟩--Accords arabes ⟨3 maps⟩--Accords avec l'U.R.S.S. ⟨4 maps⟩.

WORLD. Atlas of world history; edited by R⟨obert⟩ R⟨oswell⟩ Palmer. Contributing editors: Knight Biggerstaff ⟨and others⟩. Chicago, Rand McNally and Company. ⟨1957⟩ 216 p. maps (part col.) tables.

WORLD. The TIMES Atlas of the World, Mid-Century Edition. Edited by John Bartholomew Vol. V, The Americas. Boston: Houghton Mifflin Company, 1957. $25.00 (plates 97-120; 57 pp. name index. Part of projected 5-volume set. Vol. III, Northern Europe appeared in 1955; Vol. IV, Southern Europe and Africa, in 1956).

WORLD. Économie Mondiale... 1:32,000,000. Institut de Géographie, Université de Zurich. Bern, Kümmerly & Frey, ⟨1957⟩ (Economic map of the world - with text.)

WORLD. Atlas de Nederlandse Antillen, Suriname, Nederland en de Wereld. Dr. A.J.C. Kraft. Groningen, J.B. Wolters, 1956. (World atlas with 13 pages of maps on the Netherlands West Indies and Surinam.)

WORLD. Atlas Untuk Sekolah Lanjutan. 3rd printing with corrections. ⟨Djakarta⟩ Djambatan, 1957. (World Atlas with 17 pages of Indonesian maps.)

WYOMING. Wyoming soils map. Scale 1:500,000. Prepared by T.J. Dunnewald, in cooperation with the U.S. Soil Conservation Service. ⟨Laramie, Wyo.⟩ University of Wyoming, Agricultural Experiment Station, 1957. "Issued in conjunction with Bulletin 349, 'Wyoming soils and soil materials,' by T.J. Dunnewald." ($3.00).

EARLY SCIENCE BOOKS

The History of Science Society at the University of Illinois is undertaking a long range publishing program in cooperation with the University of Illinois Press. The Society hopes to make available early books basic in the various sciences which are out-of-print and unavailable except in collection's of rare books. Suggestions of early titles in the field of geography and mapping which should be made available through reproduction are welcomed by the Society. Bill Woods will be happy to pass along such suggestions.

NATIONAL GEOGRAPHIC SOCIETY ATLAS

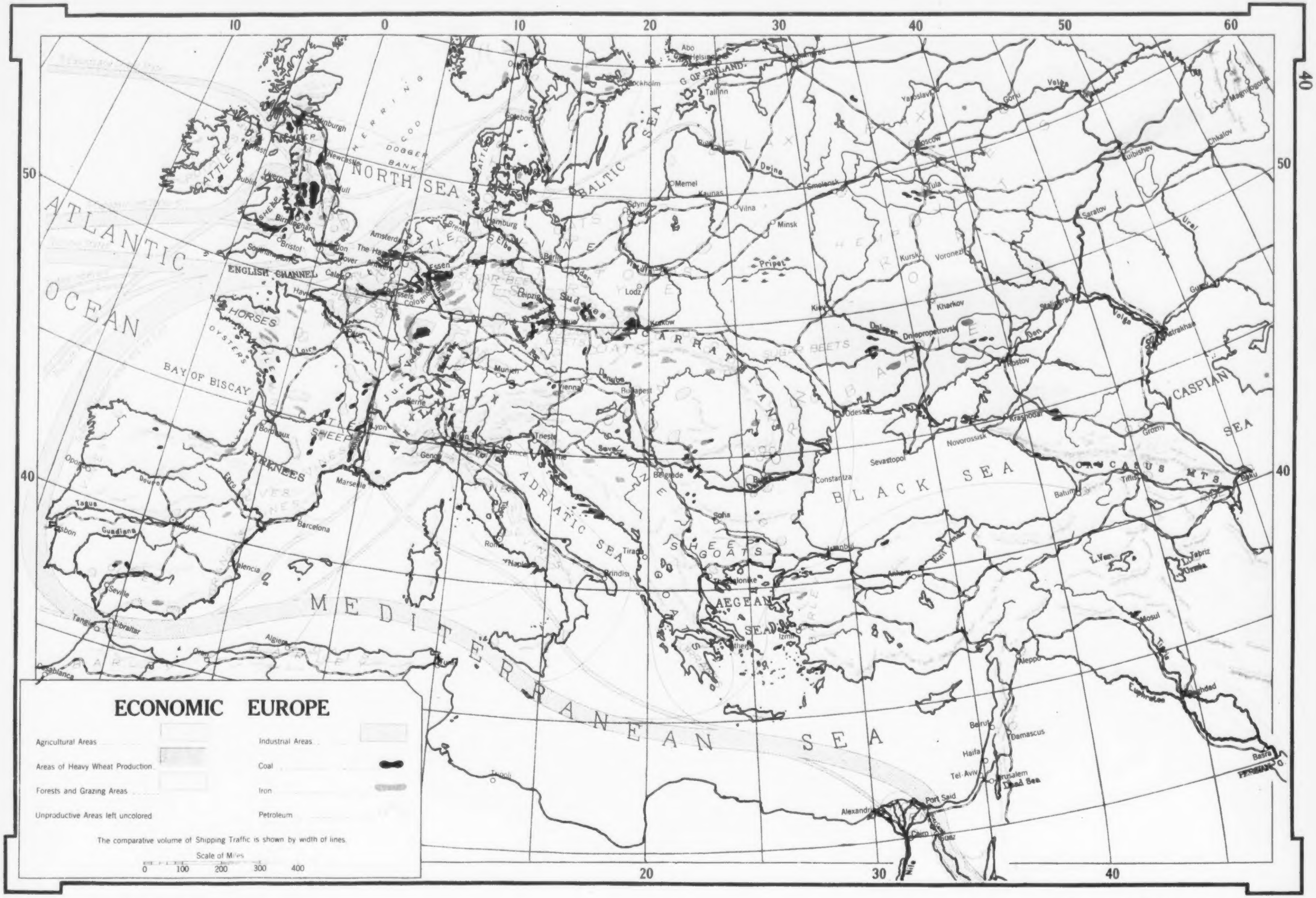
The National Geographic Society has announced a new map publishing program. Instead of the four maps per year which has been the practice for several years the Society will issue with the National Geographic Magazine a series of maps of the same size intended to provide world wide coverage. A portfolio intended for storing the Maps is being prepared. To be issued with the portfolio is a glossary of geographic terms. When the series of maps is completed a gazetteer of some 120,000 place names will be issued. During 1958 seven of the maps will be issued. The first, Southeastern United States, appeared in January. Special Maps will also be issued from time to time.

PAUL PFINZING (1554-1599)

Perhaps some of your readers would be interested in an article I found in ERDKUNDE, Vol. XI, Heft 2, Mai 1957, published in Bonn, Germany under the auspices of Carl Troll, Entitled "Pfinzing, ein vergessener kartograph" by Ernst Gagel, it is in German, but has a short summary in English, as follows:

> "The purpose of the paper is to draw attention to an important German cartographer of the 16th century, the Nuremberg senator Paul Pfinzing (1554-1599). Pfinzing's importance lies in the field of topographic (medium scale) maps and further in the fact that he developed the system of surveying by means of a compass traverse. He wrote about his experiences as a cartographer in a book which was published in 1598. In it he explains in German all the fields of practical cartography from the making of the necessary instruments and the surveying in the field, to the construction of the map on the drawing board."

The article has nine illustrations taken from his book, and a striking map in color of part of "Amt Horsbruck, Ausschnitt Hohenstein, 1596", by Paul Pfinzing. (Ena Yonge)



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